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ABSTRACT

A study was made to: (1) examine differences of Type A (competitive) and Type B (non-competitive) children in competitive and noncompetitive situations; (2) identify relationships between physiological and behavioral measures; (3) identify the standards Type A children adopt in evaluating their performance; and (4) assess concurrence between two measures of Type A behavior. Participants were 49 fifth-grade boys and girls. Prior to testing, teachers completed the MYTH rating scale for all subjects while subjects completed the Hunter-Wolf Self-Rating Scale, a self-report test for Type A characteristics. Subjects' height, weight, and baseline blood pressure and heart rate were recorded. The experimental task consisted of computer games, some requiring knowledge of fractions and one game ("Math Blaster") which required students to use computational and reaction time skills if they wished to attain a high score. "Math Blaster" was first played noncompetitively. Subjects later played in competition with their previous score or the fictive score of an unnamed classmate. Physiological measures were repeated three times across the testing session. Test results: (1) help to clarify the ways Type A children choose evaluation standards; (2) show lack of convergent validity for the two measures of Type A behavior; (3) find marginal support for physiological differences between Type A and B subjects; (4) find partical support for differences by type on performance measures and choice of evaluation standard; and (5) support predictions on sex and race differences. In conclusion, the Type A subjects appear to choose the performances of others as standards against which to compete; Type B children tend to choose their own previous performance. (Author/RH)

PHYSIOLOGICAL REACTIVITY AND COMPARISON BEHAVIOR OF TYPE A CHILDREN

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ABSTRACT

The present study examined the differences in performance and physiological reactivity of Type A and Type B children in competitive and non-competitive situations. In addition, an attempt was made to identify the standards Type A children adopt in evaluating the quality of their performance -- standards of performance established by similar peers or standards derived on the basis of their own past performance.

Using a computerized math game as the experimental task, the performance of 49 Type A and Type B fifth grade males and females under competitive and non-competitive situations was observed. Subjects were given an opportunity to choose a standard against which to evaluate their performance. In addition, blood pressure and pulse rate were recorded in order to examine physiological reactivity of Type A and Type B children in competitive and non-competitive situations.

Hypothesized physiological differences between Type As and Bs in the non-competitive condition failed to reach significance, occurring in the direction opposite to that predicted. Hypothesized Type A-B differences in level of performance and choice of evaluation standard were partially supported by the data. Implications for future research are presented.

AIMS

I. Examine the differences in task performance of Type A and Type B children in competitive and non-competitive situations.

II. Examine possible relationships between physiological reactivity and behavioral responses of Type A and Type B children in challenging situations.

III. Identify the standards Type A children adopt in evaluating the quality of their performance: (1) those established by similarly performing co-actors, or (2) those derived on the basis of their own past performance.

IV. Examine the degree of concurrence between two measures of Pattern A in childhood: The MYTH and the Hunter-Wolf Self-Rating Scale.

METHOD

A sample of 49 predominantly middle-class fifth-grade males (n=22) and females (n=27) was obtained from a local public elementary school. Of the male subjects, 6 were black and the remaining 16 were white; of the female subjects, 4 were black and 23 were white. Average age of the sample was 10.5 years. Twenty-seven of the students were volunteers from regular placement classrooms and the remaining 22 subjects were obtained from a classroom designated for the academically gifted.

Prior to the study, teachers completed the MYTH for all students participating in the study. The experimenter remained blind to the subjects' Type A-B classifications throughout the experimental session. In a within-subjects design, students were tested individually on a series of tasks designed to elicit competitive behaviors characteristic of the Type A pattern. Prior to the tasks, subjects' height, weight and baseline blood pressure and heartrate levels were recorded. In addition, subjects also completed the Hunter-Wolf Self-Rating Scale, a self-report measure of Type A behaviors in childhood.

TASKS

Subjects were told they would be playing several games on the computer which would require some knowledge of math, specifically fractions. Previous discussions with the classroom teachers indicated that, while the problems were challenging, most students would be sufficiently knowledgeable with fraction operations to at least attempt the task. A series of three example problems were given on paper and the subject was asked to respond verbally with the correct answer. Once the experimenter was satisfied the subject understood the nature of the task, the subject was given an opportunity to play the game on his/her own in order to get familiarized with both the task and the computer.

Subjects then completed another series of problems and scores on this task were used as general indices of the subjects' competence in solving the fraction problems. Blood pressure and pulse measures were recorded following completion of the task to determine if performance of the task in the absence of explicit standards effected any changes in cardiovascular responses from baseline level.

The final phase of the testing session involved a fast-paced, arcade-type game called "Math Blaster" which requires both computational and reaction time skills for attaining high scores on the task. After the game was demonstrated by the experimenter, the subject was asked to play a game "just for fun" without any assistance. No special instructions were given and subjects were not told their scores would be recorded at the end of the task. This phase comprised the non-competitive condition. Blood pressure and pulse measures were recorded for each subject immediately following completion of the task.

Subjects were then told their score on the game and were asked to play the game again. Each was told to indicate on a sheet of paper whether they would prefer to try to beat their own previous score or to beat an unnamed classmate's score for each of 10 games. If the subject indicated he/she would like to beat his/her own previous score for the first of the 10 games, he/she was reminded of the score and instructed to begin the game whenever ready. If the subject indicated he/she wished to try to beat the classmate's score, the experimenter stated a hypothetical score which was just slightly higher than the subject's own previous score and instructed the subject to begin when ready. At completion of the second (competitive) Math Blaster game, blood presure and pulse measurements were again recorded.

RESULTS

Comparison of Classification Measures:

While initial correlational analyses showed the MYTH and Hunter-Wolf Rating Scale to be significantly related, separate analyses with each measure often resulted in contradictory findings. The lack of convergent validity between the teacher-assessed Type A measure and the Hunter-Wolf suggests that they are not measuring the same constructs. For instance, there are few items on the Hunter-Wolf which deal with the competitive, achievement-striving aspect of Pattern A. Conversely, factor analyses of MYTH items yield a competitive achievement-striving component in addition to an impatience-aggression factor (Matthews & Angulo, 1980). Factor analyses of the Hunter-Wolfk items yield the following components: eagerness-energy, restlessness-agression, leadership, and alienation (Wolf et al., 1982). Thus, the finding of a significant correlation between these two measures in the present study seems to depend largely upon the commonality of their aggression components.

Sex and Race Differences:

As predicted, males classified by the MYTH tended to score higher than females on this measure. This tendency is consistent with results obtained by Matthews and Angulo (1980) in validation of the MYTH. The authors interpreted their findings in terms of socialization processes. Competitiveness and aggressiveness are encouraged more in boys since these qualities are believed to lead to success in typically masculine endeavors. This same prevalence of Pattern A in males is observed in adults (Waldron, 1978) and may have its origin in childhood.

Significant race differences were also obtained with the MYTH. Results indicated that white males tended to score the highest, followed next by white females and black males, and lastly, by black females. Again, socialization processes may be responsible. White males are encouraged to compete and achieve in areas traditionally dominated by white males, whereas these behaviors in white females and black males are just in recent years being encouraged as socially acceptable. Of these four subgroups, black females are the least likely to receive social approval for aggressive and competitive behaviors since these are inconsistent with the roles traditionally assigned to black females.

Physiological Differences Between As and Bs:

In the present study, Type As classified by the MYTH did not differ significantly from Type Bs in systolic pressure, diastolic pressure, or pulse rate across experimental conditions. In fact, instead of demonstrating higher levels of physiological reactivity than Type Bs, Type As showed a decrease in systolic pressure from baseline to the non-competitive and competitive conditions, rising again toward baseline in the recovery phase. Only Type A females showed a decrease in diastolic pressure from baseline, with the other three subgroups remaining fairly stable across tasks. Pulse rates for both Type As and Type Bs dropped from baseline, though this tendency was more pronounced for Type B subjects. Also, Type As showed slower recovery to baseline pulse rate than the other three subgroups.

Thus, the hypothesis that As would demonstrate higher systolic and diastolic blood pressure in the non-competitive and competitive conditions was not supported. The expected differences between Type As and Bs occurred in the opposite direction. And, while differences between Type As and Bs were not shown to be significant, there is a clear difference in the patterns of response across conditions between Type As and Bs.

Type A-B Differences on Performance Measures:

There were no significant differences between MYTH- or Hunter-Wolf classified Type As and Type Bs in math competency with fractions, nor was there a significant effect of gender. Though group means were not significantly different, inspection of the means indicates that Type As completed the task in considerably less time than the other three subgroups. However, it is clear from the group means for the number of problems solved correctly that Type As are not necessarily more competent than their Type B counterparts. Type As lower time lapse scores may be more reflective of their tendency to perform rapidly than of any superiority in aptitude.

Contrary to the experimenter's predictions, Type As did not demonstrate superior performance to Type Bs in the non-competitive condition. However, the gender by type interaction effect was partially supportive of this prediction. Type A males classified by the MYTH tended to score higher than the other three subgroups but, Type B females scored higher than Type A females. Analyses of performance scores of MYTH-classified Type As and Type Bs in the competitive task indicated no significant gender or type effects, a finding consistent with the hypotheses. These results are supported by previous findings that Type As and Bs perform equally well on tasks in which explicit standards for performance are made available (Matthews, 1979).

A-B Differences in Choice of Competition Standard:

Type A subjects classified by the MYTH demonstrated a tendency to choose hypothetical classmates equally as often as their own past performance as standards against which to compete for ten successive games of Math Blaster. Type Bs, on the other hand, tended to choose their own previous performance as a standard more frequently. While these results were not statistically significant, they did suggest that Type As see both their classmates and their own past performance as relevant standards against which to gauge future performance. Chi-square analyses of choices made by subjects for the first of the ten games yielded significant results. Type As tended to choose their classmate as a standard against which to compete in the competitive condition nearly as often as their own previous performance. Type Bs, however, almost always tended to choose their own previous performance.

This greater tendency for comparison with others' performance reflects Type As' competitiveness and excessive achievement-striving. Type As may be less able than Type Bs to construct their own internal standards for performance and use that of similar or superior others as a criterion. It is possible that Type A children receive inadequate or ambiguous feedback from parents or significant others and must turn to peers as comparison standards.

CONCLUSION

While the results of the present study were only partially supportive of the hypotheses, they helped to clarify the ways in which Type A children choose standards for evaluation of their performance. Research has shown that there exists a developmental increase in comparison behaviors among children and that there are age-related changes in the role of peers in children's self-evaluations in an achievement context (Ruble et al., 1980; Ruble et al., 1976). These comparison behaviors have been shown to begin as early as kindergarten level. These comparison behaviors may be the basis from which the excessive achievement-striving aspect of Pattern A begins to develop.

The present study provides marginal support for childhood A-B differences in physiological reactivity to certain types of tasks. It appears that Type As and Bs may differ in the degree to which they allocate attention to demands of the task at hand and autonomically respond to these demands. From existing research, it is reasonable to suggest that Type A individuals are autonomically reactive to environmental conditions and that repeated autonomic responses in the absence of physiological demand enhance Type As risk of cardiovascular pathology (Matthews, 1982).